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“Knowledge is such a treasure which cannot be stolen”



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IS : 9175 ( Part 11 ) - 1985

*Indian Standard*

**SPECIFICATION FOR  
RATIONALIZED STEELS FOR  
AUTOMOBILE AND ANCILLARY INDUSTRY,  
MECHANICAL AND PHYSICAL PROPERTIES**

**PART 11 25C12S14 GRADE STEEL**

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**INDIAN STANDARDS INSTITUTION**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

*Indian Standard*

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RATIONALIZED STEELS FOR  
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**PART 11 25C12S14 GRADE STEEL**

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## *Indian Standard*

# SPECIFICATION FOR RATIONALIZED STEELS FOR AUTOMOBILE AND ANCILLARY INDUSTRY, MECHANICAL AND PHYSICAL PROPERTIES

## PART 11 25C12S14 GRADE STEEL

### 0. FOREWORD

**0.1** This Indian Standard ( Part 11 ) was adopted by the Indian Standards Institution on 26 December 1985, after the draft finalized by the Co-ordinating Committee on Materials for Automobiles had been approved by the Structural and Metals Division Council.

**0.2** The Part 1 of this standard was published in 1979 which covered the chemical composition of 33 rationalized steels. The mechanical properties, hardenability and isothermal transformation characteristics of these 33 rationalized steels are now being covered in different parts of this standard ( Parts 2 to 34 ). The data concerning these properties given in this standard is only for guidance and information purposes.

**0.3** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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### 1. SCOPE

**1.1** This standard ( Part 11 ) covers the chemical composition and mechanical properties of 25C12S14 grade of steel for use by automobile and ancillary industry.

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\*Rules for rounding off numerical values ( revised ).

## 2. CHEMICAL COMPOSITION

2.1 The chemical composition of this grade of steel shall be as given below:

<i>Constituents, Percent</i>				
C	Si	Mn	S	P
0.20-0.30	0.25 <i>Max</i>	1.00-1.50	0.10-0.18	0.060 <i>Max</i>

## 3. HARDNESS

3.1 The hardness for this grade of steel delivered in annealed or normalized condition, when determined in accordance with IS : 1500-1983\*, shall be 187 HB maximum.

## 4. MECHANICAL PROPERTIES

4.1 The mechanical properties of this grade of steel when supplied in the hot rolled or normalized and cold drawn condition, when determined in accordance with IS : 1608-1972†, shall be as given below and in Table 1, respectively:

Tensile strength, MPa, <i>Min</i>	490
Elongation, percent, gauge length 5.65 $\sqrt{A}$ , <i>Min</i>	20

**TABLE 1 SPECIFIED TENSILE LIMITS FOR COLD-DRAWN BARS**

	TENSILE STRENGTH MPa	ELONGATION, PERCENT GAUGE LENGTH 5.65 $\sqrt{A}$ , <i>Min</i>
Up to 20 mm	610-740	8
Over 20 mm and up to 40 mm	550-680	10
Over 40 mm and up to 63 mm	510-640	11
Over 63 mm	490-620	13

## 5. HOT WORKING AND HEAT TREATMENT TEMPERATURES

5.1 The recommended heat treatment temperatures are as given below:

Forging/rolling temperature	1 250°C
Annealing temperature	860-910°C

\*Methods for Brinell hardness test for metallic materials ( *second revision* ).

†Method for tensile testing of steel products ( *first revision* ).



**IS : 9175 ( Part 11 ) - 1985**

Normalizing temperature	860-910°C
Carburizing temperature	880-930°C
Refining after carburizing	870-900°C
Hardening temperature	760-780°C
Tempering temperature	620°C <i>Max</i>

**6. MACHINABILITY RATING**

**6.1** Machinability of these steels is approximately 50 percent better than the normal quality mild steel.

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**Panel to Collect Data on Steel for Automobile Purposes, SMDC 31 : P12**

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